HIGH PERFORMANCE POLYMERS

RadiciGroup Stable Orange Colour Solutions for high-voltage xEV components

Automotive electrification has introduced unprecedented challenges for new development, such as:

- Increased energy density of Li-ion batteries requiring higher fire resistance (UL 94 V0)
- Miniaturization of components requiring a high Comparative Tracking Index (CTI) (>500 V)
- High dielectric properties over a broad range of temperatures (-40°C to +150°C)
- Long-term reliability during the longer xEV lifetime (>10,000 h vs 3,000 h for ICE)
- Easy recognition of high-voltage components in any conditions of use (stable orange colour after exposure for 1008 h at 130 - 140°C with legible laser marking)

RadiciGroup High Performance Polymers is able to fulfil all above requirements thanks to the **development of new RAL 2003** stable orange colour, laser markable and electrically neutral grades in both **Radilon®** and **Radiflam®** polyamide 6 and 66 and, for applications requiring higher dimensional stability, **Raditer®** and **Radiflam® B** polybutylene terephthalate (PBT). These materials show excellent colour stability (between 3 and 5 Delta E units according to ASTM D2244) after exposure for 1000 hours at 130°C and 250 hours at 150°C without a reduction in critical safety characteristics, such as UL 94 V0, CTI and insulation properties, as reported in the table below.

GRADE	RADITER B RV300K 5138 OR	RADITER B ERV300TKB 5138 OR	RADILON S RV300K 5138 OR	RADILON A RV300K 5138 OR	RADIFLAM A FR 5138 OR	RADIFLAM S RV300HFL 5138 OR	RADILON S RV250 FR2 5138 OR
0 h Reference							
After 500 h @ 130°C							
After 1000 h @ 130°C							

GRADE	Classification	Colour Reference	UL rating	CTI	Colour stability
RADITER B RV300K 5138 OR	PBT GF30-T	RAL 2003	HB	550 V	Up to 150°C
RADITER B ERV300TKB 5138 OR	PBT GF30-T HR	RAL 2003	HB	600 V	Up to 150°C
RADILON S RV300K 5138 OR	PA6 GF30-T	RAL 2003	HB	500 V	Up to 130°C
RADILON A RV300K 5138 OR	PA66 GF30-T	RAL 2003	HB	600 V	Up to 130°C
RADIFLAM A FR 5138 OR	PA66 FR unfilled	RAL 2003	V0@0.8mm	600 V	Up to 130°C
RADIFLAM S RV300HFL 5138 OR	PA6 GF30 FR HF	RAL 2003	V0@0.8mm	600 V	Up to 130°C
RADILON S RV250FR2 5138 OR	PA6 GF25 FR	RAL 2003	V2@0.8mm	550 V	Up to 130°C

Tailor-made grades may be developed upon request.

Laser Marking of our Grades - Orange HT for E-Mobility

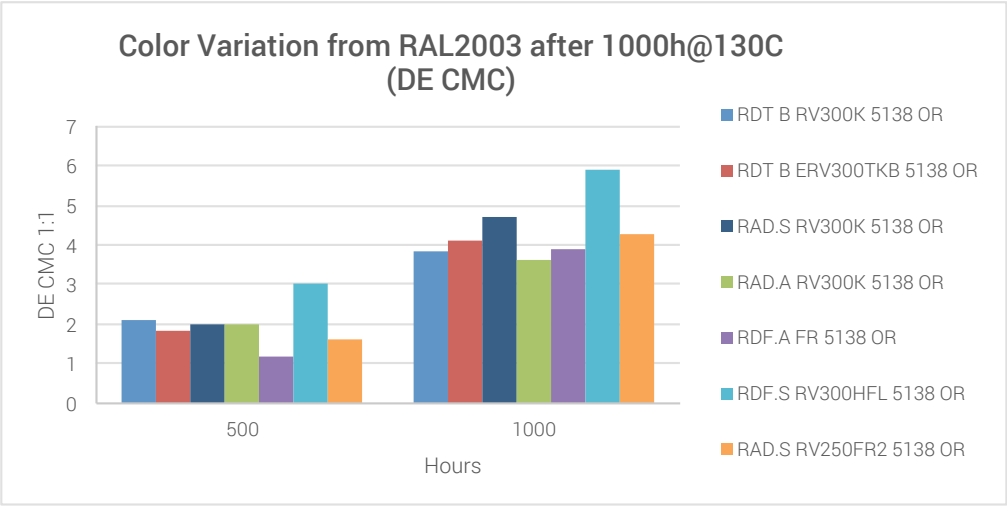
Technical partner for laser marking test:

EVLASER
CUSTOM TECHNOLOGIES SINCE 1978

https://www.evlaser.com/

GRADE	RADILON S RV300K 5138 OR	RADITER B ERV300TKB 5138 OR
Laser speed	400 mm/s	1000 mm/s
Laser frequency	30 kHz	50 kHz
Power (with 30 W laser)	90%	50%
Laser marking quality		

Example of DMC marking performance with 1064 nm IR laser



"No critical color variation after heat aging @130C (even @150C for selected grades).The RAL2003 Orange color remain stable for all our compounds"

Properties vs Benefits of Stable Orange Colour Product Line from RadiciGroup High Performance Polymers:	
Property	Benefit
CTI >500 V	Improved safety and reliability due to reduced risk of electrical failure. Reduced creepage distance enabling miniaturization and cost reduction.
Electrically neutral heat stabilization system	Long-term reliability due to reduced risk of electrochemical corrosion.
UL 94 V0 at low thickness	Improved safety due to reduced risk of fire propagation.
Laser printable stable orange colour	Improved safety due to faster identification of critical high-voltage components. Improved productivity leading to lower reject rates during processing, thus enabling significant manufacturing cost reduction.

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